

entraining fluidized bed wherein a means for introducing solids and a means for introducing fluid into said second bed are both adjacent to one end of said second fluidized bed so that said solids and said fluid introduced into said second bed flow concurrently through said second bed from said one end toward another end of said second fluidized bed remote from said one end, first means connecting said first fluidized bed to said second fluidized bed adjacent to said second end of said first fluidized bed and said one end of said second fluidized bed and second means connecting said first and said second fluidized beds adjacent said first end of said first bed and said other end of said second fluidized bed,"

Basically claim 1 defines the structure of a pair of fluidised beds interconnected in a special manner to provide an apparatus different from any other apparatus of which Applicant is aware and adapted for carrying out the method claimed in claims 14 to 20 inclusive

In the defined invention the first bed at a second end has a fluid inlet for fluidising fluid and an outlet connecting the second end of the first bed with one end of the second bed.

Assuming bed 1 of Stevenson is equivalent to the first bed of the present invention, then the bottom of bed 1 must be equivalent to the second end of the first bed of the present invention (the bottom of bed 1 is where the fluidising fluid is introduced), but there is no connection to bed 2 at the end of bed 2 where both solids and fluidising fluid are introduced to bed 2 (second Bed). Thus this interpretation clearly does not anticipate the claimed invention of the present invention

Assuming that bed 2 of Stevenson is equivalent to the first bed of the present invention then there is no connection between the second end of the first bed and the one end (where fluid and solids are introduced in the present invention and thus again there can be no anticipation of the claimed invention.

In addition to the description above, the following is different in the apparatus of the present invention relative to the Stevenson apparatus:

In the apparatus of the present invention as defined by the apparatus claims herein, inherently both beds are connected forming one liquid solid circulating fluidized bed - this is a unique

configuration not shown in the prior art of which Applicant is aware.

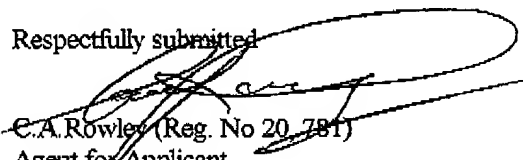
Stevenson has two beds which are multistage and not connected. In the apparatus of the present invention the solids must form a continuous moving loop. In Stevenson, the solids are always withdrawn from the bottom of each bed using air pressure and deposited at the top of each bed, thus they move downwards (in the same direction) in both beds. In the apparatus of the present invention, the operation may be and in fact normally will be continuous. In Stevenson the operation is intermittent. Thus there are fundamental differences in setup and operation between the apparatus of the present invention and that of Stevenson.

It is believed the invention claimed in claims 1 to 14 inclusive is patentable over the Stevenson reference the apparatus of which is different from the apparatus of the present invention and clearly is not useful for or capable of the carrying out the method of the present invention.

The term "co current" has been change to co-current to correct the obvious error and it is believed overcomes the objection to the term co current in claim.

It is believed this application is now in condition for Allowance and such action is respectfully requested.

Respectfully submitted

  
C.A. Rowley (Reg. No 20,781)  
Agent for Applicant  
March 11, 2002  
Telephone (613) 398 1409  
Fax (613) 308 1446

#### Certificate of Transmission

Transmitted are	Amendment letter	3 pages	Marked claims	4 pages
Clean claims	4pages	Total	11pages	

I hereby certify that this correspondence is being facsimile transmitted to the United States Patent and Trademark Office (Fax no. (703) 872 9311)

Typed name of the person signing this certificate  
Signature

cc March 11, 2002  
(Date)

C.A. Rowley  


**Marked-up claims****Claims**

1. A fluidized bed system comprising a first fluidized bed, means to feed solids  
into said first fluidized bed adjacent to a first end of said first fluidized bed and  
5 means to feed fluid into said first fluidized bed adjacent to a second end of said  
first fluidized bed, said second end being remote from said first end so that said  
solids and said fluid flow in counter current, a second fluidized bed, said second  
fluidized bed being an entraining fluidized bed wherein a means for introducing  
solids and a means for introducing fluid into said second bed are both adjacent  
10 to [the] one end of said second fluidized bed so that said solids and said fluid  
introduced into said second bed flow concurrently through said second bed from  
said one end toward another end of said second fluidized bed remote from said  
one end, first means connecting said first fluidized bed to said second fluidized  
bed adjacent to said second end of said first fluidized bed and said one end of  
15 said second fluidized bed and second means connecting said first and said  
second fluidized beds adjacent said first end of said first bed and said other end  
of said second fluidized bed, said first means connecting being adapted to form a  
hydraulic seal between said first and second fluidized beds and said second  
means connecting includes said means to feed solids into said first fluidized bed.  
20
2. A fluidized bed system as defined in claim 1 wherein said first and second  
fluidized beds are substantially vertical columns.
3. A fluidized bed system as defined in claim 2 wherein said second means  
connecting said first and said second fluidized beds includes a separator means  
for separating solids from fluid and exhausting such separated fluid to provide  
25 separated solids
4. A fluidized bed system as defined in claim 3 wherein second means connecting  
said first and said second fluidized beds further includes a washer for washing  
said solids before they are fed into said first end of said first fluidized bed.
5. A fluidized bed system as defined in claim 2 wherein said first means  
30 connecting said first and said second fluidized beds includes a second washer for

13

washing solids adjacent to said second end of said first fluidized before they are introduced into said second fluidized bed.

- 5 6. A fluidized bed system as defined in claim 3 wherein said first means connecting said first and said second fluidized beds includes a second washer for washing solids adjacent to said second end of said first fluidized before they are introduced into said second fluidized bed.
- 10 7. A fluidized bed system as defined in claim 4 wherein said first means connecting said first and said second fluidized beds includes a second washer for washing solids adjacent to said second end of said first fluidized before they are introduced into said second fluidized bed.
- 15 8. A fluidized bed system as defined in claim 1 wherein said first fluidized bed is an absorber for separating ionic products of interest and said second fluidized bed is a desorber for desorption of ionic products and said solids are ion exchange particles. said second means for connecting including said means to feed solids into said first fluidized bed.
- 20 9. A fluidized bed system as defined in claim 2 wherein said first fluidized bed is an absorber for separating ionic products of interest and said second fluidized bed is a desorber for desorption of ionic products and said solids are ion exchange particles. said second means for connecting including said means to feed solids into said first fluidized bed.
- 25 10. A fluidized bed system as defined in claim 3 wherein said first fluidized bed is an absorber for separating ionic products of interest and said second fluidized bed is a desorber for desorption of ionic products and said solids are ion exchange particles. said second means for connecting including said means to feed solids into said first fluidized bed.
- 30 11. A fluidized bed system as defined in claim 4 wherein said first fluidized bed is an absorber for separating ionic products of interest and said second fluidized bed is a desorber for desorption of ionic products and said solids are ion exchange particles. said second means for connecting including said means to feed solids into said first fluidized bed.

14

12. A fluidized bed system as defined in claim 5 wherein said first fluidized bed is an absorber for separating ionic products of interest and said second fluidized bed is a desorber for desorption of ionic products and said solids are ion exchange particles. said second means for connecting including said means to feed solids into said first fluidized bed.
13. A fluidized bed system as defined in claim 6 wherein said first fluidized bed is an absorber for separating ionic products of interest and said second fluidized bed is a desorber for desorption of ionic products and said solids are ion exchange particles. said second means for connecting including said means to feed solids into said first fluidized bed.
14. A fluidized bed system as defined in claim 7 wherein said first fluidized bed is an absorber for separating ionic products of interest and said second fluidized bed is a desorber for desorption of ionic products and said solids are ion exchange particles. said second means for connecting including said means to feed solids into said first fluidized bed.
15. A method for recovering ionic products of interest comprising passing ion exchange particles in countercurrent flow with a feed stream of a first fluid through a first fluidized bed for adsorption of ionic products of interest from said feed stream of said first fluid, transferring said particles with adsorbed ionic products of interest from said first fluidized bed to a second fluidized bed and passing said ion exchange particles with adsorbed ionic products in [co current] co-current flow with an extract buffer of a second fluid through said second fluidized bed for desorption of said adsorbed ionic products of interest, separating said second fluid containing said ionic products of interest desorbed from said ion exchange particles by said second fluid to provide regenerated ion exchange particles and returning said regenerated ion exchanged particles into said first fluidized bed to flow in countercurrent with said first fluid.
16. A method as defined in claim 15 wherein said ion exchange particles with adsorbed ionic products are washed before being introduced into said second fluidized bed

15

17. A method as defined in claim 16 wherein said regenerated ion exchange particles are washed before being returned to said first fluidized bed

18. A method as defined in claim 16 wherein said ionic product is a protein and said first fluid is a fermentation broth.

5 19. A method as defined in claim 16 wherein said ionic product is a metal and said first fluid is sea water.

20. A method as defined in claim 16 wherein said ionic product is an enzyme and said first fluid is dextrose syrup.

10